On-board software for the Solar Orbiter satellite

Critical software

01 THE CHALLENGE

The Solar Orbiter mission is a joint European Space Agency (ESA) and National Aeronautics and Space (NASA) collaboration that will address the central question of heliophysics, with major scientific payloads from the United States and the provision of a launch by NASA.

The Solar Orbiter will study the role of the engine at the very centre of the solar system - the Sun. It will explore the origins of solar wind and the acceleration of particles by tracing the evolution of transient phenomena such as 'coronal mass ejections'.

Critical Software's involvement in the project included the specification, design, development and testing of parts of the Solar Orbiter Central Software. Support on the development of the on-board central software included altitude and orbit control sub-system (AOCS) equipment management, the system software, the platform software and the payload equipment manager. Since all of these components were classified as critical, the software production and product assurance had to comply with the demanding standards set out in DAL-B.

Critical Software was chosen by Airbus Defence & Space to develop the appropriate solution for this project.

02 THE SOLUTION

Critical Software supported Airbus Defence & Space following an engineering allocation process that ensured close collaboration across the multi-site development teams. This process involved the colocation of two highly-specialised engineers at the client's premises, offering specific project expertise and mitigating against common project risks, such as delays, coordination and communication.

The central software requirements and the detailed design of the architecture's specifications were developed in close collaboration with Airbus Defence & Space at their Stevenage premises in the UK. The central software development (coding, unit-testing and product assurance activities) were performed at Critical Software's premises.

Additionally, Critical Software supported the Airbus Defence & Space team on the integration, validation and testing of all central software components.

03 THE STANDARDS

• ERC32 microprocessor.

• C and JAVA programming languages and GNU Development Tools.

• Development and verification &validation activities were supported by tools such as the VectorCAST test framework, AIRBUS' SVF and the Logiscope for static code analysis.

04 THE CLIENT

AIRBUS
DEFENCE & SPACE

ABOUT CRITICAL SOFTWARE

Critical Software provides systems and software services for safety, mission and business-critical applications. We work closely with our clients, helping them to meet the most demanding standards for performance and reliability.

We were founded in 1998, with NASA our very first client. Today, we work across many international industries and have offices across the globe.

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We are CMMI Maturity Level 5 rated.
For a list of our certifications & standards visit our website.